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ABSTRACT

FACED WITH A MULTIPLICITY OF PROBLEMS CAUSED BY A FOUR-QUARTER SCHOOL YEAR, FLORIDA ATLANTIC UNIVERSITY OFFERS A SELF-INSTRUCTIONAL LANGUAGE CURRICULUM BASED ON BEHAVIORAL OBJECTIVES. BOOKS, AUDIO-TAPES, AND VIDEO-TAPES ARE USED EXCLUSIVELY IN THE SPANISH, FRENCH, GERMAN, AND RUSSIAN COURSES. PROGRAMED LEARNING, CURRICULUM DEVELOPMENT, MATERIALS, MEDIA, AND TESTING ARE ALSO EXAMINED. STUDENT EVALUATION QUESTIONNAIRES AND A BIBLIOGRAPHY ARE INCLUDED IN THE APPENDIX. (FL)

THE SELF-INSTRUCTIONAL FOREIGN LANGUAGE PROGRAM AT FLORIDA ATLANTIC UNIVERSITY

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THE SELF-INSTRUCTIONAL FOREIGN LANGUAGE PROGRAM AT FAU

Juan Estarellas

I. The Problem

A great problem in foreign language teaching today is a surplus of students and shortage of instructors. In many schools and colleges there are thirty to forty students per instructor. Even with the aid of a language laboratory, this instructor-pupil ratio makes it very difficult to provide adequate instruction.

The standards in foreign language teaching are affected by the large number of students and overcrowded classrooms, by the use of different teaching methods, and by the varying foreign language aptitudes of the students. The instructional problem is most acute in the elementary courses because of the psychological aspects involved in learning language skills. In addition, the cost of providing this basic instruction is very high, and many universities have to use untrained graduate assistants as teachers.

Florida Atlantic University faces these same problems, complicated by the fact that it is a senior university which begins with the junior year and operates on a quarter system. Ideally, a foreign language department at a university of this type should teach only upper level courses and graduate programs. Most of the colleges which make up this university, however, have foreign language proficiency requirements for graduation and upper level course work. Also, because of the varying quality of their junior college preparation, many students interested in majoring in foreign languages fail to meet the standards set by the Department of Languages and Linguistics and have deficiencies in their major language or are without any background in a minor language. In spite of close cooperation between the Department of Languages and Linguistics of the senior university and most Florida junior colleges, the problem of college requirements or deficiencies in elementary courses will persist for many years to come. It must be solved without sending the students back to the junior college or penalizing them for faults which were the responsibility of their advisers or foreign language departments. Therefore it is up to this Department of Languages and Linguistics to provide adequate elementary courses so that students can meet foreign language proficiency requirements of their colleges, make

up their foreign language deficiencies, and take as many courses as possible so that they can use the language while still in the university.

This task is a tremendous undertaking for a university using the quarter system, since the Department must provide the whole sequence of elementary courses every quarter so that any new student entering the university during any quarter may begin the sequence. These basic courses must be offered in the Fall, Winter, Spring, and Summer terms so that a student may begin the sequence, follow it without a gap, and finish his requirements in as short a period as his language aptitude permits. This raises the cost of manpower, aggravates the problem of poor instruction, and jeopardizes proper standards at all course levels.

The only possible way for the Department to cope with this problem without enlarging upper level classes is by the use of self-instructional programmed materials. These materials have to be incorporated in books, audio-tapes, and video-tapes. When such materials were sought from the market, however, none proved to be satisfactory for its purpose. It was then necessary for the Department to develop its own self-instructional programs to meet its standards in the elementary and advanced courses.

II. The Present Stage of Programmed Instruction

An inspection of the different lists of programmed instruction materials in foreign languages published in the last few years by the Clearinghouse for Self-Instructional Materials of the Center for Applied Linguistics shows a tremendous increase in these materials. Nevertheless, there is still a great deal of resistance to the use of these programs by instructors and administrators. Much of this resistance stems from a poor understanding of the use of such materials or a lack of confidence in them, confusion about the role of the instructor in programmed instruction, and the negative reactions of some students. There is also considerable and often confusing debate about the use of total or partial self-instruction.

Unfortunately, most criticism and praise of programming is based on individual programs, while both the construction and evaluation of such programs tend to be idiosyncratic and subjective. Programming language skills is still in its early stages and there is a great deal of research to be done. While the theoretical merits and psychological rationale of programming lan-

guage skills are generally valid, the success of a particular program depends on many variables: the techniques used in programming, the selection of lexical and structural items, the size of steps, the type of learner, the instructional media used, and others.

Criticism against the programming of language skills has been increasing recently, even from its earliest advocates. The usual criticisms are that the students miss the instructor, that reinforcement by machine is not enough to induce "motivation," and that learning by programmed material is monotonous. Critics have charged that programming does not provide the proper transfer of learning since patterns learned by dialogue with machines and in artificial drills are unrealistic and very different from natural communication. They maintain that the student only learns a formal model of "how" to say something without actually knowing "what" to say in a living situation.

For an administrator or an instructor who faces overcrowded classrooms and is interested in programming, the problem is not the difference between "how" to say things and "what" to say. Instead, it is the practical one of finding a program that will produce language abilities similar or equivalent to those produced by traditional methods. The increasing pressure for quality instruction in an age of mass education compels us to explore the possibilities and limitations of programming.

III. Theoretical Background

Programmed instruction is based on Skinner's theories of learning and his concepts of functional analysis and operant conditioning. Chomsky and other linguists have criticized the application of Skinnerian concepts of functional analysis to verbal behavior. Chomsky tries to demonstrate that verbal behavior is too complex to be explained by behaviorist psychology. He maintains that such behavior cannot be predicted or controlled by observing and manipulating the physical environment of the speaker. Skinner and other behaviorists deal with the function of language and behavioral chains of language, whereas linguists deal with the form or the strings of the forms.

Essential to second language self-instruction skills is the fact that "operant conditioning" provides for a classification of verbal responses and indicates how these responses can be strengthened by reinforcement to become verbal operants. Transformationalists explain linguistic rules and the acquisition

of these rules by induction (something close to Field theories of learning). This theory is an abstract approach to the "whole," complex aspect of language, and at present does not supply a very workable procedure for self-instruction in basic language skills. While the finding of transformationalists may provide the basis for linguistic models which will facilitate second language self-instruction, at present there is no such model.

Linguists should be concerned with the "what" of language learning and psychologists with the "how". It is unfortunate that some linguists try to set tenets for "what" before finding out more about "how". Language instruction has been determined by linguistic theories, with complete disregard for the finding of psychology. Little collaboration has existed between the two sciences, accounting for the inadequacy of research in language instruction and the inefficiency of present teaching. Second-language programming reflects some of this background. Many programs are based on the assumptions of applied linguistics, from sequencing by an analysis of the learner's native and foreign languages to the designation of terminal behavior.

In constructing a program, there are certain factors to be considered: the definition of terminal behavior, the items to be taught, the organization and presentation of these items, mechanisms of reinforcement, and others. Applied linguistics offers norms which the programmer can use to establish criteria for terminal behavior, acceptable linguistic forms, and the sequencing of responses. The main focus of the programming strategy, however, should be based on psycholinguistic theories and research.

Miller's "verbal context" provides one highly useful psycholinguistic tool for programming. Verbal context refers to the interdependence of verbal units and to the extent that a verbal unit is determined in a language by other verbal units. In brief, the verbal context of a verbal unit "is all the communicative acts which surround any specific verbal unit." As Professor Skinner might say, the verbal context is the special conditioning by which verbal and non-verbal environment has reinforced any unit of verbal behavior to make it a verbal operant.

The concept of "verbal context" involves other concepts borrowed from communications theory, such as the amount of "information" carried by any of the units which form the message. "Information" is thus based on choice, and the amount of "information" of any verbal unit in a message is the range

of possible alternatives that may occur. For instance, in the Spanish noun phrase *la casa, casa* carries less "information" than its English counterpart *house* in the noun phrase *the house. Casa* indicates to a native speaker of Spanish that only the alternatives of feminine and singular nouns may occur in that position. In English, the position of *house* in the phrase *the house* indicates that any noun, singular or plural, masculine or feminine, may be used.

Information leads to "redundancy," the degree to which more *symbols* are used to encode a message than are theoretically necessary. The grammatical rules of all languages are sources for redundancy. For instance, in the Spanish phrase *yo soy bueno, yo* is redundant since *soy* already indicates that only *yo* can precede.

The concepts of verbal context, information, and redundancy lead to the concept of "control." Through information and redundancy, messages can be controlled, since their verbal context has been built and controlled by mechanisms which are sometimes verbal and sometimes non-verbal. Verbal behavior is constrained by the audience, the grammar, the situation, needs, and experience. Because of this, language skills are programmable.

A comparison of language with semiotics may be useful at this point. In any communication process semiotics are involved. Semiotics, as Morris has indicated, has its rules without which communication is impossible. The controlling rules are: 1) relation of signs to other signs; 2) relation of signs to designata; and 3) relation of signs to their users. Thus, the "sign context" of any sign is its interdependence with other signs, the relation of the sign to what it stands for, and the environmental factors which reinforce the behavior of those who use the sign in encoding or decoding. The information and redundancy of each sign in its context are what control the behavior of the encoder or decoder.

Language has different levels of signs. In the spoken language there are the phonemic, morphemic, and syntactic levels. In the written language there are letters, affixes, words, and sentence levels. When the learner faces a new language he is confronted with different kinds of semiotic systems, with different linguistic and psychological problems. Any sign has a tremendous amount of "information" for him and there is no "redundancy" at all.

In programming a second language, linguistics has emphasized the problems of interference, contrastive analysis, and the echoing of language patterns by means of intraverbal and other

responses, while psychology has only furnished the principle of behavior control. In most cases the cooperation of both sciences has been in the production of materials in which the learner is exercised in auditory descrimination of sounds, production of these sounds and memorization of different structures commonly used by native speakers by the constructed or multiple choice response techniques. Writing is taught as an afterthought and mostly in relation to words. Furthermore, due to the procedures used, programming cannot be evaluated properly inasmuch as the programs today use only echoic, transcription, textual, dictation, and intraverbal responses. The assumption that the verbal operants produced are *mands* or *tacts* is merely that of the programmer. Other responses might be reinforced in this way but tacts, as well as mands, need environmental reinforcement, which is missing in all programs. It is expected that the learner will transfer from one functional class to another. For instance, from "ask for a pencil in French", he will produce the mand, "Donnez-moi le crayon"; however, this is an intraverbal response since the reinforcing environmental factors are missing. This approach is not very conducive to the development of a "verbal context" for the learner. Besides, it does not make him aware of the redundancy of the language and the amount of "information" of the verbal units.

Most programs quickly move the students to syntactic structures with the purpose of making the learning meaningful to the students, thus placing an immediate emphasis on dialogues. These programs begin with the complexity of the language and do not make any attempt to build the syntactic structures link by link, to reinforce proper autoclitic behavior. They do not indicate and control the morphological, syntactic, and environmental cues which govern the different transformations in the code manipulation. Thus there is difficulty in structuring intralanguage and extralanguage associations and building behavioral "chains" for proper encoding and decoding behavior. Furthermore, these programs place the emphasis of the control mechanisms of verbal behavior on the language as a whole, but not on the variables and factors of communication. They do not provide the necessary control of the "verbal context to give the learner the step by step controls which govern native speaking or writing on any semiotic level. The best attempt along these lines was made by Morton with his use of "grammatical signals."

Up to the present, the most that the best programs have been able to achieve in terminal behavior has been formal repertoires, with a point to point correspondence between stimulus and response. Students know "how" to say but not "what" to say. Thus, there is very little chance for proper transfer to different environmental conditions. Knowing *what* to say is the ability to respond appropriately to the nature of the stimulus conditions. These are thematic repertoires which can be achieved in programming, provided that the variables of media, content, and technique are related to the verbal context.

Programming is not far away from achieving a combination of formal and thematic repertoires as terminal behavior. A psycholinguistic model for second language learning which would produce a combination of these repertoires should begin by teaching the two related levels of signs, phonemes and graphemes. This can be accomplished by using aural discrimination, dictation responses, and other similar techniques involving the use of redundancy. This approach makes the learner aware of the amount of information of each sign. The learner should not be allowed to proceed until he has mastered the verbal context of the phonemic and graphemic level. It is only in this way that behavioral links for the language "chain" can begin to be formed.

Syntactic structures can also be taught by building the controls of the "verbal context" step by step or link by link. Environmental reinforcement or further redundancy can be applied by programming TV, and turning TV into an individual teaching machine as part of a dial-access system. Emphasis should be placed first on morphological relationships in the building of noun phrases, verb phrases, and so forth. Teaching should be based on learning in context. For instance, the student is asked to relate a determiner and a noun in response to a picture. The next problem is the production of the whole noun phrase at the appearance of a picture. This is the beginning of *tacts,* while *mands* can be taught by asking the students to request objects or actions in normal environmental verbal communication. For instance, the program says, "Ask the gentleman to pass the bread." The student asks the question and the next frame reinforces by showing the gentleman passing the bread. Many situations like this can be organized to further develop the intralanguage and extralanguage associations of the verbal context for the learner which will lead to a truly verbal and operant repertoire by self-instruction.

IV. Objectives and Content of the Program

The complete language curriculum at Florida Atlantic University is based on behavioral objectives. A group of courses in a general area of a language form a level. These levels refer to certain specific behavioral objectives that have to be attained by the students in that area. Each course and each level have their own terminal behavior and examinations. Some levels, especially the lower levels, are prerequisite for the next level. For instance, level I is the area of Basic Skills: Listening, Speaking, Reading, Writing, which includes courses 301, 302, 303, 304, 305, 306. These numbers represent quarters and the total represents the equivalent of two years of college study.

Level I is prerequisite for Level II: Conversation and Composition. Level II is prerequisite for Level III: the Culture and Civilization level. In the upper levels students do not need to take all the courses offered in that level, but they do need to reach the terminal behavior which is the requirement for that level. In this way we know exactly what the student has learned after taking this examination. Other upper levels are in other areas of languages and linguistics since the department offers a major in modern languages and another in languages and linguistics.

The department has begun to develop totally self-instructional courses for Level I (courses 301 - 302 - 303 - 304 - 305 - 306) in Spanish, French, German and Russian. The terminal objectives of these courses has been taken from what is considered the national objectives for two years of college instruction in foreign languages. At the time of this writing, Spanish 301 - 302 - 303 is available and has been in use for two years. One French sequence is almost completed and the students have been using the first part for some time. The first part of the German course is also ready and is now undergoing evaluation. The Russian is only in a planning stage and it is anticipated that it will be made available sometime in 1969.

The theories used in programming have been the same for each language. Of course, it is impossible to pattern the linguistic problems of one language to parallel exactly the linguistic problems of another language. It is necessary for the programming team in each language to use a somewhat different grammatical and technical approach in order to solve the problems that are peculiar to that particular language.

The content and objectives of the courses are determined by evaluating the structures and vocabulary deemed necessary by the Modern Language Association, by examining the most widely used texts, and by compiling a vocabulary list of high frequency words. The vocabulary list is programmed mathematically according to class and function and compiled on a computer for control of entry and reentry of items according to a formula based on frequency. This produces lists of lexical items divided into different grammatical categories. First year students (301 - 302 - 303) in Spanish, French, and German have to achieve recognition and production of approximately one thousand words. At the completion of these courses the student will have mastered an average of twelve basic syntactic structures including about twenty derivations of these structures.

A brief and general description of the content of Spanish 301 - 302 - 303 follows:

Part I: From Sound to Letter — The general purpose of this part is to teach the student discrimination and production of Spanish sounds and their sequence, stress and intonation patterns, as well as the syllabification, writing, and reading of these sounds.

Part II: Spanish Syntactic Structures — noun phrases; determiners; descriptive adjectives; verb phrases; subject personal pronouns; several verbs including *Tener que;* colors; cardinal numbers; first, second, and third conjugations.

Part III: Spanish Syntactic Structures — *Ser* and *Estar;* limiting adjectives; ordinal numbers; question words; prepositions; direct object pronouns; demonstrative pronouns; telling time; stem-changing verbs; prepositions; pronouns; indirect object pronouns.

Part IV: Spanish Syntactic Structures — irregular verbs; weather; descriptive adjectives before nouns; command; comparatives and superlatives; preterite and future of verbs; possessives; present participle; irregular preterites; object pronouns with commands, infinitives, and present participles; adverbs of time; relative pronouns *Que, Quien;* regular and irregular present perfect; contrast of *Haber de, Tener que,* and *Deber;* passive voice; irregular futures; reflexive verbs; imperfect.

French and German follow the same general content although with the natural variation of the grammar of the language and the practicality of grouping, sequencing, and priority of items accord-

ing to the difficulties of American students learning that particular language.

V. Materials and Equipment

Materials

The materials for the FAU Spanish self-instructional course are presented by video tapes, audio tapes, and books. Technique is mostly linear. The first part teaches the pronunciation and writing of Spanish sounds by means of audio tapes and workbooks. It is not necessary to make video tapes for this part. The book is coordinated with the audio tapes and includes sections on vowels, consonants, linking, stress, intonation, and syllabification. Phonemic-graphemic relationships are taught by first presenting the relationships between sounds and letters in a series of frames. In the following frames students must discriminate between a group of graphemes while listening to a sound. Later, the students are presented with frames of minimal pairs each missing a grapheme which they must fill in while listening to the pronunciation of the words. In subsequent frames, the students progress from one missing grapheme to several and then to entire words. In this way the student is made aware of the amount of information of each unit in its verbal context. In all the material the student is taught to make a relationship between the sound signs and the written signs and to make a response to the stimulus of the tape. All responses are reinforced by the program.

The program is designed to be presented by audio tape and book or by video tape. Both programs cover the same material and each is divided into levels which are further broken down into problems. Unfortunately, because of budgetary limitations the video version of the program is not complete. When video tape is used, however, the book is made available as a supplementary aid. Without video, the book is essential. With either medium the student is asked to write the problems first, and then to respond to them on the tapes.

The video tape has a format similar to the books, although animation is used as the course progresses. An information panel is presented to the student which explains the problem. Then he is presented with frames as follows:

Level 2. Problem 1.
Frame 1

el
los
la
las

_____ hombre

The student has to respond to this frame by selecting the correct determiner. For instance:

Level 2. Problem 1.
Frame 1

__el__ hombre

He goes through a series of frames like this and then the determiners fade away. Next he is given only the picture and the noun referring to the picture and he must supply the appropriate determiner. For instance:

Level 2. Problem 1.
Frame 6

_____ mujer

The next frame reinforces the response.

Level 2. Problem 1.
Frame 7

__la__ mujer

In the next type of frame an oral and written stimulus with a picture appears. For instance:

Level 2. Problem 1.
Frame 12

_____ son pequeños.

The student sees this type of frame at least three times before he is asked to respond. Then he must produce the whole noun phrase referring to the picture. Again, the next frame reinforces the student's response.

Level 2. Problem 1.
Frame 13

Los relojes son pequeños.

In this way he proceeds to all the determiners: *este, ese, aquel, nuestro, suyo, mi, su, un* with all their morphological variations. Different cues are used for these determiners, such as a hand touching something for *este.* After a group of determiners, there is a review on the form of the determiners. For instance, a frame asks:

Level 2. Problem 4.
Frame 1

¿El niño?

The student must respond by referring to the picture with the proper form of the determiner and noun. The next frame gives the correct response. This is one of the approaches for developing tacts.

Level 2. Problem 4.
Frame 2

No, las niñas.

As the student proceeds there are other review problems on the form and meaning of the determiner. Here he must not only transform the determiner but the meaning of the determiner. For instance:

Level 2. Problem 6.
Frame 5

¿ Aquel reloj?

The student must respond with the proper form and meaning of the determiner describing the picture and the noun.

Level 2. Problem 6.
Frame 6

No, este barco.

Thus the program moves to other levels and problems. Descriptive adjectives, subject personal pronouns, verbs, and other items are taught in this way. The student learns structural relationships as they relate to language behavior and experience. There are different kinds of levels, problems, and types of frames. Some are pattern transformations, others are substitutions of structures or verbal units, and some are practice frames. All problems have

explicit instructions for the student. The following frame shows one problem dealing with descriptive adjectives:

Level 5. Problem 5.
Frame 15

¿Es un examen difícil?

The student must respond to the cue in the picture. The correct response is in the next frame.

Level 5. Problem 5.
Frame 16

No, mi examen es fácil.

This involves a change of determiner and descriptive adjective.

With verbs, the program presents a series of frames practicing conjugations. Then it moves to a problem which practices the meaning of the verbs. For example:

Level 9. Problem 3.
Frame 12

¿Trabaja Mercedes en la cocina?

The next frame reinforces the response.

Level 9. Problem 3.
Frame 13

No. Mercedes no trabaja en la cocina. Canta en la cocina.

From these types of frames the program moves to complex situations in which the student has a conversation with the TV or audio tape. There are picture stories about which the student is asked questions, and sections where he asks questions and receives answers.

Mands are also developed in this program. For example, in one frame there is a man sitting at a table with a glass at his left and a cup at his right. The student is told in the instructions to ask for the object by name and, when the object is passed, to thank the person.

(Tape: Pídale a Antonio el objeto a su izquierda.)

The student asks for the object and the correct response is reinforced in the next frame.

Antonio, dame el vaso, por favor.

The next frame shows Antonio passing the glass. There is a pause for the student to thank him and then the correct response is reinforced.

Muchas gracias.

The programmed materials use a variety of techniques. One of these is the constructed response in which the student provides either a morphological or syntactical change or a transformational derivation. Other programming techniques include multiple choice, questions about readings and picture stories, dialogues which require the student to take the role of one of the speakers, dictation, and free conversation. For each of these approaches the program attempts to provide the student with enough grammatical and environmental redundancy to make his responses as spontaneous and natural as in normal conversation. No English is used in the program except for instructions and grammatical explanations. The estimated tape time is fifty hours for 7,000 frames.

The still cartoons for the program are video-taped. To be taped, they first have to be made into 2 by 2 transparencies. These transparencies are then placed into two Spindler Sauppe projectors, projected into a vidicon camera, and recorded on an Ampex VR-1500 video tape recorder. People with drawings are introduced in conversation problems for easier transfer by an R.C.A. TK60 4½ inch image orthicon camera. Conversation is conducted in the following manner: a person fishing in a narrow river points to a projected situation such as a lady swimming in a side swimming pool, and says, *"Yo pesco en este río estrecho. ¿Y mi esposa?"* The student is given a pause to answer and then the correct frame appears. In this frame a second person says to the first, *"Su esposa nada en esta piscina ancha,"* and indicates the slide. Stories are told by a series of short animated pictures with a voice and written captions explaining the story. Then the pictures appear again and questions are asked about the stories. The student is given a pause to answer and then the correct frames appear.

Equipment

The laboratory specifications were designed under my direction and installed by Continuous Progress Education, Inc. The laboratory has 40 positions. Students in the booths are able to dial-select any one of 100 audio programs from a remote-program library. In addition, at ten positions students are able to dial-select video programs from two remote video tape recorders. They are able to rewind and replay programs at will for study or review purposes. Original programs can be prepared on these video tape recorders or on TV facilities at the University for replay in the laboratory. Ten of the forty positions have full push-button control of personal remote tape recorders. At these positions the students are able to automatically record the dial-selected program and their own responses as well. They are in complete control of the recorder and are able to reverse, fastforward, replay and stop the machine. Meters and lights indicate the position of the tape in the machine. The console, which is located on the other side of a glass wall in an adjoining room, has all of the functions of a conventional language laboratory console. There are monitoring and communication facilities and instructors are able to test at the console by simultaneously recording groups of students.

VI. Teaching and Testing Procedures at FAU

The following is a description of the procedures used in teaching Spanish 301 - 302 - 303. At registration the students receive a mimeographed sheet of instructions which explains the course. They are told that there will be no regular class meetings because the course is programmed and totally self-instructional. They are asked to attend an introductory meeting with the person who is in charge of the course and the language laboratory. At this meeting they are given all the necessary information on materials, lab procedures, lab schedules, exams, and grading. After this they are on their own; they have no scheduled classes or meetings. There is an instructor in charge of the courses in case any problem arises, but it is interesting to note that very few students contact him. The teaching procedure is totally self-instructional. The students may take the examinations at any time during the day on two days of the week. This permits them to move ahead at their own speed. There are a series of self-evaluating exams available for the student so that he will be able to determine his own progress. Also, there are the normally scheduled university examina-

tions each quarter. Only grades of *A* or *B* are considered passing grades. 95% to 100% is A; 90% to 95% is B. Students failing to pass an exam for the second time receive a failing grade for the course.

The examinations for the FAU programmed courses are graded by computer. We have developed a special technique whereby the computer can be used to evaluate production.

The examinations for *From Sound to Letter* (Book I) test for: (1) recognition of sounds: vowels, consonants, dipthongs, tripthongs (sound to graphic symbol technique), (2) pronunciation through recognition of sound to graphic symbol, (3) linking of sound segments, (4) stress of sound segments, (5) intonation through recognition of intonation patterns, and (6) syllabification.

The examinations for Syntactic Structures (Books II, III, IV) test for: (1) vocabulary through recognition of pictures (sound to picture), (2) vocabulary through recognition of sound to graphic symbol (opposites), (3) auditory comprehension (sound to picture), (4) pronunciation through recognition of sound to graphic symbol, (5) control of grammatical structure through recognition of words, or word clusters (word order given), (6) control of production of grammatical structure (word order not given), (7) production of words and grammatical structure (Spanish sentences and picture cues given; words and word order not given), (8) Production of words and grammatical structures (cues given in English sentences only), (9) integrated skills: auditory comprehension—reading comprehension, and (10) integrated skills: dictation—from sound cues to graphic symbols.

VII. Evaluation of the Program

Besides the normal evaluation of terminal behavior, item analysis and student attitudes at FAU, the program has been evaluated in a number of other institutions, high schools and junior colleges. The program has also been used for supplementary and remedial purposes by students using other textbooks and audio tapes. These evaluations are useful as comparative studies. The data presented in this paper refers only to the audio tape Spanish programs used at FAU, the University of Hartford in Connecticut, Nova High School in Ft. Lauderdale, Florida, and Forest Hills High School in West Palm Beach, Florida.

The theories behind the self-instructional language program were originally tested at the University of Hartford in Hartford, Connecticut, during 1963-66. There an early form of the program

was used, with very few drawings. The program was used to teach two sections of elementary Spanish to a group of fifty-four students. For a full school year, these students learned Spanish with only the language laboratory, the mimeographed sheets of the program, and an instructor available for consultation. Besides the regular tests for the course, Form LA of the MLA Cooperative Achievement Test was administered to the students at the end of the year to evaluate the results of the experiment. The students, mostly freshmen, were also given a questionnaire to fill in. In speaking and listening, the students showed an achievement level somewhat superior to the norms of the MLA test. In reading and writing, their scores were slightly lower. In their questionnaires the great majority of the students expressed a favorable attitude to the programmed approach.

Since then, the program has been reorganized and has been in use in its present form at Florida Atlantic University for two years. In this time it has been used by over 500 students. Only the grades of A (95% to 100%) and B (90% to 95%) are given. Students who get less than 90% or do not take the final are given a grade of Incomplete on their first try. Up to the present, 70% have received A's, 20% B's and 10% Incompletes.

The Kuder-Richardson Test for internal reliability was performed on the final examination of the program. Reliability coefficients theoretically can range from .00 to 1.00. It is very unusual to find commercial achievement tests with reliability coefficients below .70. The result for the Department's exam was a coefficient of .94 which indicated the efficiency of the examination relative to the course.

To learn student reactions to the program, and to give the students a chance to offer criticisms and suggestions, a questionnaire has been given to a representative number of students taking the course each term. This questionnaire has been used to improve procedures and to uncover problem areas.

The reaction of the students to the program has been generally quite favorable. They enjoy the responsibility, find that they are better able to schedule other studying and classes, and do not object to the lack of contact with an instructor. More importantly, the feel that the program helps them to learn Spanish at their own rate and with a sense of involvement in the method. Above all, they find the pictures very helpful aids to understanding. Their major criticism has been directed at the section on syntactic struc-

tures in Book II. Certain pictoral cues were confusing, there was an over-dependence on written stimuli, and too short a pause between stimulus and reinforcement, making it difficult for the student to answer. All this has been corrected.

Because of the emphasis on the aural-oral approach, there has been some controversy about teaching reading and writing at the beginning of an elementary course. Many people think these two skills should be taught later to avoid interference, but this approach deals with whole words. From the beginning of its program, the Department knew that its method of teaching sounds and letters simultaneously was very helpful to the students. To learn how this procedure would affect students using other materials, the Department conducted an experiment at Nova High School, Fort Lauderdale, Florida, in the Fall of 1965. A beginning class of Spanish with no background in the language was divided into two fairly homogeneous groups according to I.Q. scores. One group used self-instructional materials with the audio tapes and worked on vowels, consonants, linking, stress, intonation, and syllabification. The control group began with the audio-lingual materials in the conventional manner with a teacher. The experimental group used total self-instruction.

At the end of the self-instructional period, the experimental group was tested in all the areas studied. In comparison with the control group it was far superior. The experimental group was then given the audio-lingual materials. In a short period it had overtaken the control group in dialogue mastery and had moved out in front of the control group in its rate of learning and in the material mastered. At the same time its reading, writing and pronunciation was better than that of the control group.

In 1966 another experiment was carried out with the same materials at Forest Hills High School, West Palm Beach, Florida. The experiment had two objectives. The first was to determine the problems of students being taught by the audio lingual method. The second was to see if remedial work on phonemic-graphemic relationships would help them overcome these problems. A second year Spanish class was chosen. Monitoring the students during their laboratory practice drills revealed that the students had difficulty discriminating sounds, imitating speech patterns, and writing. A diagnostic test was then given to specifically identify problem areas in pronunciation and writing. This test consisted of discrimination of sounds, identification of vowels, dipthongs, con-

sonants, stress, intonation patterns, and a section on linking and writing. With a possible score of 100 the mean of this test was 73.4, the median 74, and the mode 77. The standard deviation was 8. After the test an analysis chart was made in order to pinpoint the most common problem areas. The students had the usual problems of Americans studying Spanish. In addition, they could not write unfamiliar words by simply transcribing sounds into letters.

These students were given the same materials that were given to the Nova students. They used these materials for periods of twenty minutes each week for about two months. At the end of the two months the students were given the same test that had been given at the beginning of the experiment. Now the mean was 86.2, the median 87, and the mode 89. The standard deviation was 7. Individual observation by the teachers showed that in over-all results and transfer of training these students greatly improved their pronunciation and writing. They could now imitate better, felt more confident in their aural-oral mastery, and could write unfamiliar words.

These studies of the supplementary and remedial use of the self-instructional program can also be considered comparative studies. The response of the students to the program at both schools was very favorable. The self-instructional program demonstrated that it could teach them the phonemic-graphemic aspects of Spanish more efficiently than the conventional materials they were using.

Because of budgetary limitations no data is yet available on the use of the materials at Dade Junior College, Marymount College, and other institutions. It is known, however, that a few students react negatively to an approach which does not seem immediately utilitarian. They resist learning sounds and letters without meaning but this initial resistance usually disappears.

Similar procedures are now being used to evaluate the French program. Complete data is not available but there are indications that similar results will be obtained.

VIII. Conclusion

FAU's programmed language course is not designed to verify theories of programming. Students learn from programmed instruction and failures are primarily the fault of the program, not the students. The course is designed to meet an important practical need. It enables the Department to offer quality instruction to large numbers of students and still expect high achievement. Total

self-instruction has proved to be a viable part of the normal curriculum, and instruction of the Department.

The problem of motivation remains. Professor Saltzman has pointed out that a student who does not want to learn will not be made to learn by programmed instruction. For that matter, no professor or course will make such a student learn. Although it is no panacea, programming does offer the advantages of the student's involvement and participation in the method. It also provides a sense of accomplishment at every step.

Student reaction to a new approach is always a point of concern. Undoubtedly some students miss the teacher in the beginning. They have many questions and are not aware that they will be answered in time. This response is natural for students who have been spoonfed for many years and then are suddenly left with the sole responsibility for their learning. When the self-instructional course was first established, about 40% of the students did not take the final examination and had to carry over Incompletes into the next quarter. Since then, this percentage has been lowered considerably. The Department feels this training in responsibility is an invaluable portion of its program.

The self-instructional course offers several other advantages to the students. Those with high language aptitudes do not need to waste many hours and are able to finish quickly. Those with lower aptitudes can spend more time studying the language. In either case, the students are better able to schedule their studying and classes. In addition, the grading system shows exactly what level has been mastered. Instead of receiving a grade of C, B, or A from different instructors using different methods and standards, the students and the Department know what an A or B means. The Department can then base its curriculum and objectives on proficiency rather than credits. Furthermore, the instructors who have been freed from elementary courses can be used in advanced courses with small teacher-pupil ratios. The result is better instruction and higher standards at all levels.

Administratively, the use of programmed instruction does not affect the Department in many ways. Tests and examinations are handled by the language laboratory and graded by the computer. When properly scheduled, this does not create any administrative problems. The Department of Language and Linguistics at FAU feels that the role of the department and its members has changed in this age of educational revolution. Accordingly, members in-

terested in teaching, in instructional research, and in field research all work as a team. Departmental meetings are held to discuss team problems in language or language instruction and some majors and graduate students are also involved.

One result of the Department's efforts has been a clarification of the role of the instructor in programmed instruction. There has been some fear that such methods diminish the role of the teacher. Instead, the Department has found that programmed instruction returns the basic role of teaching to the teacher by relieving him of much of the dull, repetitious work imposed by mass education. Using programmed self-instruction, the teacher can have smaller classes on the advanced level, more opportunities for research, better conditions for creative work, and less paper work.

In developing the program the Department was hampered by the size of its budget since the university did not appropriate any money for this purpose. Development was finally accomplished at a very low cost by a group of dedicated faculty and students, but a number of problems were encountered that could have been avoided by an adequate budget. There were difficulties in matching the schedules of students and staff members for the production of tapes. It was also necessary to retrain new student assistants each year. In addition, linguistic research of the target language took a great deal of time.

Despite these difficulties, the experience was invaluable for those interested in language learning. The process of programming reveals a great deal about the language, its instruction, and variables such as students and media. Much has been accomplished in the three years since the program began at the University of Hartford.

The Department of Languages and Linguistics at FAU is probably the first department dedicated to the possibilities of total self-instruction. Its future plans include the improvement of the existing approach, the development of new programs, and the evaluation of the effectiveness of various media. Other schools will soon follow this initiative. Cooperation between these institutions and the Department of Languages and Linguistics at FAU offers great potential for future development. These discoveries will help make instruction more efficient and open new avenues for the language departments of the future.

APPENDIX

UNIVERSITY OF HARTFORD June, 1963

SPANISH 110-111

Evaluation Questionnaire

In order to better evaluate the approach to teaching Spanish which we have used in this course, we would like you to express your opinion by answering the following questions. Please check your answer to the questions by indicating X in the appropriate section.

	Yes	No	No opinion
1. Do you think that the Spanish syntactical materials are helping you to learn Spanish?	50	1	3
2. In comparison to other more "traditional" language materials, do you consider these more rewarding and helpful?	44	6	4
3. Do you think that you can move better at your own rate with these materials?	49	4	1
4. Do you feel that you are being considered more mature being left on your own to study and work at the lab?	51	1	2
5. Do you feel the loss of more class contact with a teacher by having to use the lab at this stage of learning a language?	7	47	2
6. Do you enjoy being responsible for your own learning?	48	3	3

Please write additional comments here: _____

_____

_____

_____

_____

_____

_____

_____

UNIVERSITY OF HARTFORD June, 1963

EXPERIMENT: FIRST YEAR SPANISH

MLA Cooperative Foreign Language Test: Form LA

		Norm	SP 111 D	SP 111 E
Reading	M	156	156.0	154.1
	Md	155	153.3	153.3
Writing	M	157	155.8	155.3
	Md	157	155.3	153.0
Listening	M	154	161.4	148.7
	Md	152	161.0	153.3
Speaking	M	161	188.3	179.7
	Md	159	192.8	181.0

Norms taken from 556 college students from 35 colleges.

Our scores based upon 54 students.

FLORIDA ATLANTIC UNIVERSITY

Evaluation Questionnaire

From Sound to Letter

In order to better evaluate this approach to language studies which we have used in Spanish 301, we would like you to express your opinion by answering the following questions. Please check your answer to the questions by placing an X in the appropriate space provided.

	Yes	No
1. Have you had any Spanish courses before coming to FAU? If your answer is *yes*, how many credit hours did you earn? Number of credit hours _____.	_____	98%
Please list University level language courses and hours earned before coming to FAU in regard to any language studied.		
_____		
_____		
_____		
_____		
_____		
2. Based on previous language learning experiences, do you think that *From Sound to Letter* (books and tapes) is a good way to learn Spanish?	99%	_____
3. Are you using, or have you used only *From Sound to Letter* and the accompanying tapes at the beginning of the course?	100%	_____

4. Based on previous experience with more traditional approaches, do you feel that *From Sound to Letter* is more helpful in learning Spanish pronunciation and writing?	99%	____
5. Do you feel more comfortable using self-instructional programmed texts that let you progress at your own speed as opposed to the "traditional" methods?	99%	____
6. At this point in language learning, do you feel "at a loss" without a regular class and instructor?	____	99%
7. Do you feel comfortable being responsible for your own time in language study?	99%	____
8. Do you think that *From Sound to Letter* will help (helped) you progress faster and more efficiently in Spanish even if afterwards you use (used) more "traditional" books and tapes?	98%	____
9. Based on previous experience, do you feel that you are learning more and better Spanish pronunciation and writing than you might have in a conventional course?	98%	____
10. Do you find that this kind of approach requires or demands more of your time than a conventional one?	____	100%
11. Do you feel confident in regard to evaluating your own progress?	100%	____
12. Did you find some parts of the book less helpful than others in terms of the presentation? If your answer is *yes*, please indicate which parts in the space provided.		

Level: _____ Problem: _____ _____ 95%

Level: _____ Problem: _____

13. Did you find some parts of the book in which you made more errors than in others? If your answer is *yes*, please indicate which parts in the space provided.

Level: _____ Problem: _____ _____ 90%

Level: _____ Problem: _____

14. Did you find that some parts were more difficult than others in terms of the presentation? If your answer is *yes*, please indicate which parts in the space provided.

Level: _____ Problem: _____ _____ 80%

Level: _____ Problem: _____

15. Did you find some parts too easy in terms of the presentation? If your answer is *yes*, please indicate which parts in the space provided.

Level: _____ Problem: _____ _____ 90%

Level: _____ Problem: _____

16. Do you like this approach to learning the sounds of the letters in Spanish before learning structures? 96% _____

17. Do you think that learning Spanish sounds and spelling without learning the meaning of the words hinders your learning of the pronunciation and writing of the words? _____ 95%

18. Are you aware that by learning the sounds and the letters of Spanish, you are not learning the vocabulary meaning, but that you are learning another meaning, namely the value of the sounds and "meaning" of the letters and other relationships between other sounds and letters? 94% ____

Please use the rest of this page to make any comments you wish. We will appreciate any constructive criticism.

Evaluation Questionnaire

Spanish Syntactic Structures

In order to better evaluate the approach to teaching Spanish which we have used in this course, we would like you to express your opinion by answering the following questions. Please check your answer to the questions by indicating an X in the appropriate section. Answer all of the questions.

	Yes	No
1. Do you think that *Spanish Syntactic Structures* (book and tapes) helps you to learn Spanish?	100%	____
2. In comparison to other more "traditional" approaches, do you consider *Spanish Syntactic Structures* more rewarding and helpful in teaching you Spanish?	99%	____
3. Does *Spanish Syntactic Structures* enable you to move better at your own rate?	100%	____
4. Do you feel more personal involvement in the learning process of this method of instruction?	99%	____

5. Do you feel the loss of class contact with an instructor by having to work alone at this stage of learning a language?	2%	98%
6. Do you enjoy being responsible for your own learning?	100%	____
7. Do you feel that this type of work requires or demands more time than a conventional course?	3%	97%
8. Do you feel that with this procedure you can evaluate your own progress?	100%	____
9. Do you find the pictures helpful in getting the meaning?	97%	3%
10. Do you feel that you are able to produce adequate responses in Spanish without the English equivalents – in other words, do you understand what you are producing in the response frames?	98%	____
11. If you do not get the meaning immediately, can you get it later?	100%	____
12. Do you think that this method of study gives you more time to study other subjects?	98%	____
13. Do you think that taking a course such as this helps you in scheduling other classes?	100%	____
14. Did you find some parts of *Spanish Syntactic Structures* boring?	____	96%
If yes, indicate level(s), problem(s) and frame(s).		

level _____ problem _____ frame _____

level _____ problem _____ frame _____

level _____ problem _____ frame _____

15. Did you find some parts less helpful than others? _____ 98%

If *yes*, indicate level(s), problem(s) and frame(s).

level _____ problem _____ frame _____

level _____ problem _____ frame _____

level _____ problem _____ frame _____

16. Did you find some parts in which you made errors? 75% _____

If *yes*, indicate level(s), problem(s) and frame(s).

level _____ problem _____ frame _____

level _____ problem _____ frame _____

level _____ problem _____ frame _____

17. Did you find some parts which were more difficult than others? 80% _____

If *yes*, indicate level(s), problem(s) and frame(s).

level _____ problem _____ frame _____

level _____ problem _____ frame _____

level _____ problem _____ frame _____

18. Did you find some parts too easy? _____ 96%

If *yes*, indicate level(s), problem(s) and frame(s).

level _____ problem _____ frame _____

level _____ problem _____ frame _____

level _____ problem _____ frame _____

19. Did you find some places where you could not understand the meaning? 40% _____

If yes, indicate level(s), problem(s) and frame(s).

level _____ problem _____ frame _____

level _____ problem _____ frame _____

level _____ problem _____ frame _____

20. How much time (hours) have you spent listening to the tapes and working on the book?

Hours per week _____ Total Time _____

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This student is viewing the television version of Spanish Sentences. All the material in the Spanish Sentences Series adapts perfectly to audio-visual techniques.

In the language laboratory, the students can study the programmed course independently and at their own rate of speed.

These students are taking a test. Tests are given only when the student feels ready and are programmed for immediate machine correction.

The unit shown here is part of an automatic, dial-access system that makes the taped course available in the language laboratory. This system could also be connected to other parts of the campus, such as the dormitories or the library.

Professor Hernan Hurtado, Director of the language laboratory and an active participant in the development of the programmed course, shows the development and use of programmed tests to a class of future language teachers.